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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/658,919   | 09/10/2003  | John R. Grassi       | GISZ 2 00033        | 4064             |
| 7590   | 10/05/2005  |                      | EXAMINER            |                  |
| Jay F. Moldovanyi<br>Fay, Sharpe, Fagan, Minnich & McKee, LLP<br>7th Floor<br>1100 Superior Avenue<br>Cleveland, OH 44114-2518 |             |                      | LIN, ING HOUR       |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 1725                |                  |
| DATE MAILED: 10/05/2005  |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/658,919

Applicant(s)

GRASSI ET AL.

Examiner

Ing-Hour Lin

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-18, 25, 27 and 29-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-18, 25, 27 and 29-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/11, 21/05</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 36 and 42 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16 and 22 of copending Application No. 10/614,601. Although the conflicting claims are not identical, they are not patentably distinct from each other because the processing steps in claims 36 and 42 including “contacting said at least a part of said mold with a solvent” and “removing step” in this application are physically equivalent to the steps in claims 16 and 22 of copending Application No. 10/614,601.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 1-4, 7-9, 12, 15-18, 36, 39-43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pineda et al in view of Carter et al.

Pineda et al (col. 2, lines 58+) teach the claimed molding method, a water dispersible mold and method of investment casting for metal by using the mold, comprising the use of a water-soluble binder including phosphate and silica sand having lower heat diffusivity than metal for the purpose of coating a pattern and forming a water dispersible mold and casting metal by a investment casting method (col. 5, lines 39+); and teach the use of dropping the mold into water (col. 6, lines 28+) to create a heat differential to crack a portion of the mold. Further, Pineda et al (col. 6, lines 66+) teach the use of controlling and reducing binder and increasing silica sand

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or filler for the purpose of making the investment softer and easier to remove it from the casting metal.

Pineda et al fail to teach the use of rapid cooling the molten metal. However, Carter (col. 2, lines 47+) teaches the use of rapid cooling such as simultaneous molten metal pouring and immersion cooling for the purpose of forming a fine grain and reducing oxidation pitting for the casting. It would have been obvious to one having ordinary skill in the art to provide Pineda et al the use of rapid cooling the molten metal as taught by Carter et al in order to reduce cycle time of casting and refine the cast grain size by partially removing water cooled mold parts of the water dispersible mold.

6. Claims 6 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pineda et al in view of Carter et al and further in view of either JP 61245938 or Eldemallawy et al.

Pineda et al in view of Carter et al fail to teach the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite. However, either JP '938 (see abstract) or Eldemallawy et al (col. 7, lines 7+) teach the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite for the purpose of improving casting shaping quality and the mold removability. It would have been obvious to one having ordinary skill in the art to provide Pineda et al in view of Carter et al the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite as taught by JP '938 or Eldemallawy et al in order to effectively improve casting shaping quality and the mold removability.

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7. Claims 10-11, 13-14 and 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pineda et al in view of in view of Carter et al and further in view of either Sahari or Conroy et al.

Pineda et al in view of in view of Carter et al fails to teach the use of controlling the dose of binder or the use of water nozzle. However, Sahari (col. 6, lines 24+) teaches the use of nozzles (water jet, water-steam jet) and submerging the mold into water for the purpose of cooling and removing casting from the re-using the binder agent. Conroy et al (col. 4, lines 19+) teach the use of nozzles 20 and flow rate and pressure of fluid including water and surfacatant for the purpose of removing cores from castings. It would have been obvious to one having ordinary skill in the art to provide Pineda et al in view of in view of Carter et al the use of water nozzle as taught by Sahari or Conroy et al in order to control cooling the casting in the molten state and remove or crack the water soluble mold from the casting.

8. Claims 25, 27 and 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pineda et al in view of either JP 61245938 or Eldemallawy et al.

Pineda et al (col. 2, lines 58+) teach the claimed molding method, a water dispersible mold and method of investment casting for metal by using the mold, comprising the use of a water-soluble binder including phosphate and silica sand having lower heat diffusivity than metal for the purpose of coating a pattern and forming a water dispersible mold and casting metal by a investment casting method (col. 5, lines 39+); and teach the use of dropping the mold into water (col. 6, lines 28+) to create a heat differential to crack a portion of the mold. Further, Pineda et al (col. 6, lines 66+) teach the use of controlling and reducing binder and increasing silica sand

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or filler for the purpose of making the investment softer and easier to remove it from the casting metal.

Pineda et al fail to teach the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite. However, either JP '938 (see abstract) or Eldemallawy et al (col. 7, lines 7+) teach the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite for the purpose of improving casting shaping quality and the mold removability. It would have been obvious to one having ordinary skill in the art to provide Pineda et al the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite as taught by JP '938 or Eldemallawy et al in order to effectively improve casting shaping quality and the mold removability.

9. Claims 37-38 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pineda et al in view of Carter et al and further in view of Watts.

Pineda et al in view of Carter et al fails to teach the use of solidified shell having a molten metal core or using the shell as a chill. However, Watts (col. 8, lines 3+) teaches the use of solidified shell having a molten metal core or using the shell as a chill for the purpose of controlling cooling rate and microstructures of the casting. It would have been obvious to one having ordinary skill in the art to provide Pineda et al in view of Carter et al the use of solidified shell having a molten metal core or using the shell as a chill as taught by Watts in order to effectively control the cooling rate and microstructure of the casting.

***Response to Arguments***

Applicant's arguments filed on 7/19/05 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, applicant argued that Pineda et al fail to teach the use of rapid cooling the molten metal. However, Carter (col. 2, lines 47+) teaches the use of rapid cooling such as simultaneous molten metal pouring and immersion cooling for the purpose of forming a fine grain and reducing oxidation pitting for the casting. It would have been obvious to one having ordinary skill in the art to provide Pineda et al the use of rapid cooling the molten metal as taught by Carter et al in order to reduce cycle time of casting and refine the cast grain size by partially removing water cooled mold parts of the water dispersible mold as taught by Pineda et al.

**10. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the



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THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*I.H.L.*

I.-H. Lin

9-30-05

KEVIN KERNS  
PRIMARY EXAMINER *Kevin Kerns 10/3/05*